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Urban Agriculture in Harare

Household nutrition, economic costs and benefits

Results of household monitoring interviews conducted between September 1996 and April 1997.

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

ACRONYMS

ENDA	Environment and Development Activities
ESAP	Economic Structural Adjustment Programme
g	gramme
IDRC	International Development and Research Centre
kg	kilogram
l	Litre
n	Sample
UA	Urban Agriculture
Z$	Zimbabwe Dollar

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EXECUTIVE SUMMARY

1.1 Introduction

Since 1994, Enda-Zimbabwe has been carrying out research on urban agriculture in Harare. This is the third report on the IDRC-funded programme on urban agriculture in Zimbabwe. Findings presented in this report are the result of a household monitoring exercise conducted in Harare during the period September 1996 and April 1997.

Urban agriculture in Harare consists of the production of vegetables, crops and livestock by urban households for home consumption and the urban market. This activity is largely practised on a small-scale on land around the homesteads and open spaces and infrastructural servitudes within the city. The activity, mainly practised by women, is largely viewed as informal as it has no legal backing and formal support.

The harsh economic conditions due to structural adjustment policies, prominently feature as the main driving force behind the activity. The economic structural adjustment programme (ESAP) started in Zimbabwe around 1991 has worsened the plight of the urban households, mostly the poor. Removal of subsides, the consequent increase in prices of basic foodstuffs and retrenchments, meant that the urban populations are increasingly becoming poorer. Urban agriculture emerged under such a scenario as a coping strategy for poor households to sustain their livelihoods. Thus, the primary benefits of urban farming are viewed as household food security, employment, income generation and savings on purchases.

The household monitoring study set out to address in more detail the following objectives:

a) Determine the economic impact of urban agriculture on urban households (farming versus non-farming).

b) Assess the overall nutritional impact of urban agriculture products on urban households (farming versus non-farming) and health implications of the urban agriculture products.

c) Identify crop types of on and off plot urban cultivation and activities during the cropping season.

The understanding of the actual value and potential of urban agriculture in feeding urban populations is an important first step in defining the future of urban agriculture in Zimbabwe. That urban agriculture is here to stay, is a fact known by most local authorities, but how the activity can be practised in a more orderly manner, is an issue that needs to be considered seriously for the sustainability of the city environment.

1.2 Main research findings

The study showed that women are the main participants in all the activities in urban cropping and vegetable production. Apart from women being economically disadvantaged, this could also be due to the African cultural views of women as the principal actors in the provision and preparation of household food.

Gardening activities are carried throughout all seasons whereas cropping is only practised during the rainy season. As cropping activities begin to take off in October, the practice of gardening begins to decline proportionally up to the month of February. Besides shortage of land, this trend could be due to increased workload for women.

Gardening relies heavily on organic manure as compared to cropping where chemical fertilisers are used. However, due to problems of pests and diseases, there is a higher rate of pesticide utilization in the garden than the fields. Although no case of any health problems associated with the use of pesticides was identified, this is potentially hazardous especially where children were found to assist with the application of such pesticides.

Low income urban farmers tend to have fewer meals per day than the non-farmers.Most of the farmers have two meals per day whereas the non-farmers have three. This may be due to the fact that most farmers spend their time in the fields and as a result could not have time to prepare all three meals at different times (i.e. in the morning, afternoon, and evening). Although, this can also be seen as a coping strategy, breakfast time is often delayed to coincide with the afternoon meal.

The urban farmers, due to their reliance on self-produced food, have a tendency to have less of protein rich foodstuffs such as meat and fish on their dinner table as compared to the non-farmers. However, the overall health performance of the farmers is higher than the non-farming households. This is demonstrated by the higher growth rate of children under the age of five in farming households. Children of urban farmers are generally taller and heavier than those from non-farming households.

During an eight-month period, a gardening household spends an average of $113.00 on the purchase of inputs (seeds and fertilizers). One household member could work in the garden for an average time of 23.74 hours. Much of the time spent in the garden is on watering. This also explains the high rates of water charges incurred by the urban gardners. The average expenditure on cropping inputs is $157.5. Although cropping expenditure may be low, the activity is labour demanding. About two persons can be employed on a part time basis to look after a cropping field. Land preparation and weeding are the main labour demanding activities.Due to a household's reliance on own gardening produce, approximately Z$1 039.5 can be saved per annum. A maize producing household would have an annual minimum saving of Z$508.44 per year on the purchase of roller meal.

Households involved in the informal marketing of agricultural products would accrue an average income of $4 382.65 within a period of eight months. Households producing and selling chickens within the same period had a net average income of $668.42

1.3 Recommendations and the way forward

As a result of the significance and potential of urban agriculture in feeding the populations of Harare, the following recommendations were made for the formalisation and improvement of the activity.

a) Inorder to ensure security and improve management in the urban fields, enabling policies for urban agriculture should be developed.

b) Urban planners and policy makers should incorporate gender considerations in the layout design and planning of urban infrastructural services. This also entails that more gender focused research and workshops on gender sensitisation ought to be carried out.

c) Environmental and nutritional education programmes should be carried out for the low income urban residents (farmers and non farmers).

d) Environmentally sound farming models for sustainable urban agriculture should be devised.

e) Extension services, which were only accessible to rural farmers should also be made accessible to urban farmers.

f) The availability and accessibility of farming inputs to the urban poor farmers should be ensured to increase productivity.

g) Alternative technology for the utilisation and recycling of urban waste should be developed.

1.4 Chapter synopsis

Chapter 1 gives a global and national overview of urban agriculture and its significance to household food security. Background to urban agriculture in Zimbabwe is highlighted. Research objectives and methodology used in the monitoring exercise are also outlined in this chapter.

Chapter 2 describes household agricultural management patterns during the period between September 1996 and April 1997. Agro-chemical use patterns and gender involvement in particular urban agricultural activities are also examined. A monthly examination of household activities is presented. Focus is largely on gardening and cropping activities. The main problems encountered during the period are also outlined.

Chapter 3 assesses the nutritional significance of UA. Comparison is made of the well-being of farming households and non-farming households. Children under the age of five are specifically targeted to measure their growth rates and draw any correlation with participation in urban agriculture. Expenditure on food purchases by both farming and non farming households is also examined.

Chapter 4 focuses on the general household economies of the respondents. Average expenditures on household necessities by different income groups are also presented. Urban agriculture benefits and costs that accrue to the farming households have been computed. The benefits are mainly in the form of income savings generated through households consuming their own food and direct income generated from the sale of agricultural produce. The main costs incurred are in terms of expenses incurred mainly on input purchases and the time spent on the activities.

Chapter 5, Conclusion and Recommendations, brings together the major issues of the economic and nutritional sections of the report. The implications of UA to urban households and environments are assessed and the future of UA and the sustainability of city economies is critically examined. The way forward for UA in Harare is also tentatively outlined.

CHAPTER ONE: BACKGROUND AND INTRODUCTION TO THE STUDY

1.1 Global Perspective of Urban Agriculture

Urban agriculture is not just a feature of developing countries, but is also prevalent in developed countries. The main difference is in the nature of the practice, extent, management strategies and the driving force behind the activity. Whereas city dwellers in the North view urban agriculture (UA) as a backyard activity and a hobby, most urban farmers in the Southern cities take it as a source of livelihood. It is estimated that about 200 million urban residents worldwide are engaged in urban farming thereby providing food and income to about 700 million people (Mougeot, 1994).

Rees (1997) postulates that the future of most urban areas will be characterised by 'external shocks' amongst which changes in the global climate characterised by increased occurrence and magnitude of extreme weather events, such as the recurrent droughts in Southern Africa, are threatening the sustenance of urban economies. Faced with such a bleak future, urban households are forced not to continue relying on external food sources when there is great potential for cities feeding themselves. Rees argues that the urban food production system is one significant way of reducing the vulnerability of urban populations to global ecological changes.

The Brundtland Commission also pointed out that UA could actually become a vital component of urban development especially as more food will be made available to the urban poor at minimum cost (World Commission on Environment and Development, 1987). Besides serving as an important source of food, urban agriculture is also widely viewed as amounting to significant income savings on household food expenditures. Despite such perceived dietary and socio-economic benefits, both central and local governments in the developing countries do not actively support urban agriculture.

A study by the International Food Policy Institute (von Braun et al, 1993) on urban food security argued that inadequate information base on UA activities, is the main obstacle towards the formulation of enabling policies and programs by central governments and local authorities. In Zimbabwe, most local authorities have been exposed to the realities of UA. Besides limited exposure to empirical examples of successful models on how UA can be integrated in the existing land-uses, there is also a shortage of more measurable costs and benefits of the activity. Most of the imputed costs and benefits are based on conjecture rather than fact.

Those against urban cultivation view the activity as causing environmental degradation mainly in the form of siltation and eutrophication of the rivers. Besides being taken as an aspect of rural life UA, particularly livestock keeping, is also regarded as a public health nuisance. However, in Harare after the realisation that UA is a future reality city fathers are now more concerned about how this activity can be practised in an orderly manner without compromising the urban environmental and aesthetic values rather than trying to put the activity to an end (Enda-Zimbabwe, 1996a).

The Harare urban agriculture household monitoring survey conducted between the period September 1996 and April 1997 was an in-depth analysis of issues raised in earlier studies (Enda-Zimbabwe, 1994, and 1996b).

1.2 Gender implications in urban farming

The activity of urban agriculture can be viewed in terms of gender relations within a society. In Zimbabwe, as in most other African countries, crop and vegetable farming is culturally viewed as the domain of the women. Farming was historically practised in the rural areas. As most of the men migrated into urban areas in search of off-farm formal employment, this meant that farming in the rural areas was entirely left at the hands of the women. This also had significant impact on the land use practices within the urban environments. Agriculture was never seen as a viable land-use option for the open spaces in the cities and towns.

Conventional urban planning practice has been characterised by cities being divided into zones such as residential locations, industrial zones, commercial zones and recreational areas. With the increase in urban populations, due to rural-urban migrations and natural increase, and the harsh economic environment brought about by the Economic Structural Adjustment Programme (ESAP), the shortcomings of urban planning practices have been manifested. Cities in Zimbabwe, designed along these lines, no longer conform to the reality of peoples lives, both women and men.

As most of the rural areas in Zimbabwe suffered periods of devastating droughts especially in the 90s, this also meant that there was a dramatic influx of rural peoples into towns where prospects looked brighter. Unfortunately the conditions in urban areas were not better off due to the economic problems associated with ESAP. Elson (1989) argues that the brunt of structural adjustment policies is largely borne by the urban poor women who do most to compensate for declining real wages.

In studies carried out in Harare, the most common form of urban poverty is expressed as shortage of household food (Matshalaga, 1997). It is largely the need to meet household food requirements that pushes women to violate urban planning by-laws. Matshalaga (1997) pointed out that women are the principal actors in the aspects of household food security. Their roles in this aspect include actual food production, acquisition, preparation and management of food stores. As food purchases became more expensive due to removal of subsidies and the concurrent decline in real wages, the women had to devise coping strategies in order to ensure food security within the household.

However, urban agriculture should not be solely viewed as a mechanism to ensure the availability of sufficient food to the household. Urban farming also amounts to saving on income that could be used on food purchases. Maxwell (1995) argues that urban farming can be a means of protecting other sources of women's income especially where allocation from husbands to meet household needs may be insufficient.

In a study conducted by Mudimu (1996) it was pointed out that women are the main participants in urban agriculture as they are not formally employed as men. The women farmers spend an average of five to six hours in the fields usually at peak periods of land preparation and weeding. Most women gain the support of their husbands whereas few men are found against the activity as they view agriculture as the image of poverty. Men also view urban agriculture as having marginal returns.

The conflicts that arise between policy makers and urban farmers could therefore be viewed as the result of rigid environmental and planning policies which impedes rather than create an enabling environment to sustain the livelihoods of the urban poor in a changing socio-economic environment. Moser (1989) argues that there is a need for gender considerations in the planning of human settlements and housing, especially given that women are primary users of space around them.

Wilson argues that,

> " historically, gender stereotyping has profoundly affected urban planning and urban institutions. Cities are spatial and organisational expressions of social relations, which are based as much on power and conflict as on cooperation and consensus. This has meant that the needs of urban women have often been ignored." (In Gender and Development, 4 (1) 1996 pp10)

This underlines the fact that urban planning and management should conform to emerging socio-economic challenges to ensure the sustainability of the urban environment. Planners should consider gender implications in the design of urban settlements. Most of the cultivation activities take place within the homesteads and on open spaces adjacent to the residential areas. As women are the main practitioners in these agricultural activities it the issue of distance becomes important as they are also involved in other household chores which include child care.

1.3 Urban Agriculture in Zimbabwe

The rapid rate of urbanization coupled with economic adjustment policies and harsh climatic environments, is a cause of great concern for urban managers, particularly in the Third World cities. Urban areas have been generally viewed as centres which build diversified and dynamic economies , raise productivity, create jobs, wealth and provide essential services to the urban populations. Thus, cities are thereby viewed as key engines of economic and social development. With the advent of economic structural adjustment programmes in the developing countries over the last decade of the twentieth century, pressure on urban scarce resources has been rising spontaneously. This poses serious questions on the sustainability of the city system. In Harare, like most other developing cities, this has been exacerbated by increasing rates of rural to urban migration. The rate of urbanization in Harare is currently estimated to be 4.5% per annum.

Under the economic structural adjustment programme some companies have either been liquidated or have engaged in massive retrenchment programmes. Consequently, many employees have lost their jobs which comprised their major source of livelihoods. To date, since January 1997 , seven firms in the textile industry have been liquidated with sixty others experiencing serious problems. (Herald, 4 August, 1997). These activities and the general rise in the cost of living, have led most urban households to engage in informal activities to meet basic household requirements. Urban agriculture is one such informal activity.

The rise in urban agricultural activities in Zimbabwe is largely attributed to economic hardships (Enda-Zimbabwe, 1994). It is viewed as a coping strategy by urban households to sustain their livelihoods (Enda-Zimbabwe, 1996a; Matshalaga, 1997; Mudimu, 1996). It is considered as a spontaneous haphazard activity which is not planned for by the city council and hence not supported. Thus, the practice is widely viewed as an illegal activity as it is not backed by any statutory instrument.

Urban agricultural activities take place on home fronts or backyards and open public spaces around the city's built environment. The other form of agricultural activities is the marketing of agricultural produce. This is usually carried out on street corners and some council designated marketing stalls. Urban farming on home fronts and backyards (on-plot) is mainly confined to vegetable production of which the *brassica* species of green leaf vegetables are common. Small livestock rearing, mainly poultry, is also an on-plot activity mostly practised by the middle income households (Enda-Zimbabwe, 1996b).

Open space cultivation (off-plot) largely involves the production of cereal crops such as maize, sweet sorghum and root tubers mainly sweet potatoes. Such crop cultivation is usually on undeveloped land, land not suitable for buildings, infrastructural servitudes and idle public land.

Off-plot crop cultivation is the main problem of urban agriculture in which the practitioners have often clashed with the local authorities over the management of urban environments. Whereas orthodox planning principles view such open spaces as green wedges or 'ecological lungs' of the city the urban agricultural practitioners view such lands as 'idle' and therefore should be put to productive use. The usual response to such practices by city authorities has been the slashing of the semi-mature crops as a deterrent measure to curb the activity. Most agriculturalists view such responses as a manifestation of colonial practices whereby the policies that were in place were designed to serve a minority. As a result, the practitioners have been unyielding and continued with their practices until the local authorities had to exercise a certain degree of leniency.

Rees (1997) attempted to explain the reason why urban farming is not seriously considered as a possible urban land-use option. He argues that the industrial approach of short term economic efficiency which takes precedence over most public and private life values has resulted in urban farming in some cities being underrated. With the emphasis on the open market economy urban farming land has been viewed as a tradable commodity which should compete with other land-uses. Agricultural uses constitute the least land values in an urban area and therefore uneconomic.

Most urban managers and planners take little regard of the concept of cities producing their own food as opposed to reliance on external sources. Urban farming may be viewed as a transitory activity which will soon be wiped out of the city environment. This perception may be an indication that the importance of urban agricultural activities to household food security is little understood.

Recent studies and workshops confirm that urban agriculture (UA) is a recurrent feature of the urban environment and therefore strategies on how to integrate this activity with existing urban land-use systems should be considered seriously (Enda-Zimbabwe, 1996a; 1996b; Mbiba, 1995). The

significance of UA can also be demonstrated by the dramatic increase of land under cultivation in Harare between 1990 and 1994. Air surveys conducted in 1994 showed that area under cultivation nearly doubled within a period of four years. A total of 9288ha was under crop cultivation. This excludes on-plot crop cultivation. Appendix A shows the area under cultivation in Harare in 1994. The increase in land under cultivation in the 90s is mainly due to a dramatic rise in the cost of living; a rise in the cost of basic commodities and a decline in real wages.

1.4 Study Objectives

The main objective of this study is to document and analyse household socio-economic, nutritional, and environmental benefits and problems of urban agriculture. The more specific objectives are;

a) To determine the economic impact of urban agriculture on urban households (farming versus non-farming).

b) To assess the overall nutritional impact of urban agriculture products on urban households (farming versus non-farming) and the health implications of the urban agriculture products.

c) To identify crop types of on- and off-plot urban cultivation and activities during the year.

1.5 Research Methodology

Household Survey

A preliminary household survey which led to identification of monitoring households was carried out in August 1996. It was considered important for household monitoring to take place in areas where field environmental monitoring was being conducted. The assumption was that activities within the household are related to the nature of the environment in the cropping fields. The preliminary survey was conducted across four suburbs to identify and select monitoring households. A street by street random number sampling procedure was used and a total of 475 households were interviewed.

In Harare, four suburbs were initially selected to conduct the eight month long monitoring exercise. Two suburbs were from the high density residential areas (Highfield and Dzivarasekwa), one from the medium density areas (Braeside) and the other from the low density areas (Mabelreign).

The preliminary survey was also targeted towards assessing the general characteristics of the households within the suburbs. Assessment was in terms of household socio-economic characteristics, demographic composition and patterns. Issues that were looked at comprised household economic activities and income levels, household agricultural practices and tenure systems. These factors are vital in assessing the impact of urban agriculture on urban households.

The survey also intended to capture the non participants in urban agricultural activities. These would offer a basis of comparison between the agricultural and non agricultural households with similar demographic and socio-economic status.

The average household size in Harare was 5.61. Due to movements of household members the number of people per household may change periodically.The proportion of landlords to lodgers interviewed does not necessarily reflect the overall housing ownership patterns in Harare. Landlords when available at the premises do not allow lodgers the first option to participate in such surveys. Similarly lodgers prefer landlords to be interviewed as their tenure is not always guaranteed and binding. Thus a few lodgers were interviewed.

The survey also showed that more than half (60.8%) of the respondents have total household incomes below $3 000 per month. Generally there is very little income differentiation in the types of activities (particularly gardening and cropping) undertaken by different households. However, the poorest households (income below $840 per month) demonstrate the least number of participants in all categories with the exception of agricultural marketing of external products.

Selection of Monitoring Households

The monitoring households were selected from the preliminary survey conducted in August 1996. The following criteria was used in the selection of the households.

a) Household head consent to participate in the monitoring exercise.

b) Participation in agricultural activities.

c) Family size and composition.

d) Tenure system (landlord / lodger).

The full understanding and agreement by the households to participate in the whole process was an important first step in selecting monitoring households.

The nature of agricultural activities a household was engaged in was also given consideration in household selection. This would ensure extensive coverage of all urban agricultural activities. Non-participants were also selected to facilitate comparison of any incremental benefits or costs between them and the participants.

The range of agricultural activities a household was involved in played a significant part in the selection. The presumption is that a household involved in more than one activity is more likely to have more benefits than a household engaged solely in one activity all the other factors being constant. All this could have a bearing on the health status of the household.

The family composition and size influences on the allocation and distribution of the total household income. A large family size implies a heavy burden on the household consumption base. It is generally assumed that babies and children are more responsive to dietary deficiencies than adults. Thus families with at least one child under the age of five years with similar income levels were selected to facilitate assessment of the contribution of urban agriculture to household nutrition.

Comparison were therefore made between families participating in agricultural activities and the non-farming households.

Tenure system affects the length of residence for most of the urban residents. Lodgers comprise the most mobile group of urban residents who can move untimely from one house to the other or from suburb to suburb. As such, very few lodgers were selected for the monitoring exercise.

Household monitoring process

The household monitoring for socio-economic, nutritional and environmental aspects of urban agriculture started in September 1996. Household monitoring was specifically targeted to coincide with the busy agricultural season. The monitoring was conducted on a monthly basis for a period of eight months up to April 1997.

Monitoring households were selected in the four suburbs of Harare namely Mabelreign (a low density area), Highfield (high density), Dzivaresekwa (high density) and Braeside (medium density). A minimum of 50 households per survey site were initially selected. However, due to the periodic movements of the household heads, the number of respondents could vary monthly. During the course of monitoring some targeted households decided to have no part in the study as they did not envision any immediate benefits. Constant feedback on progress of the project and other notable scenarios on the activity, ensured that a minimum acceptable number of households be maintained till the end of the monitoring exercise.

The monitoring process was done with the aid of research assistants who were resident in the respective suburbs. The research assistants had to be trained on methods of conducting the monitoring using urban participatory approaches. A questionnaire which could be reviewed and updated every month was used by the enumerators as a monitoring aide.

Rationale for monthly monitoring

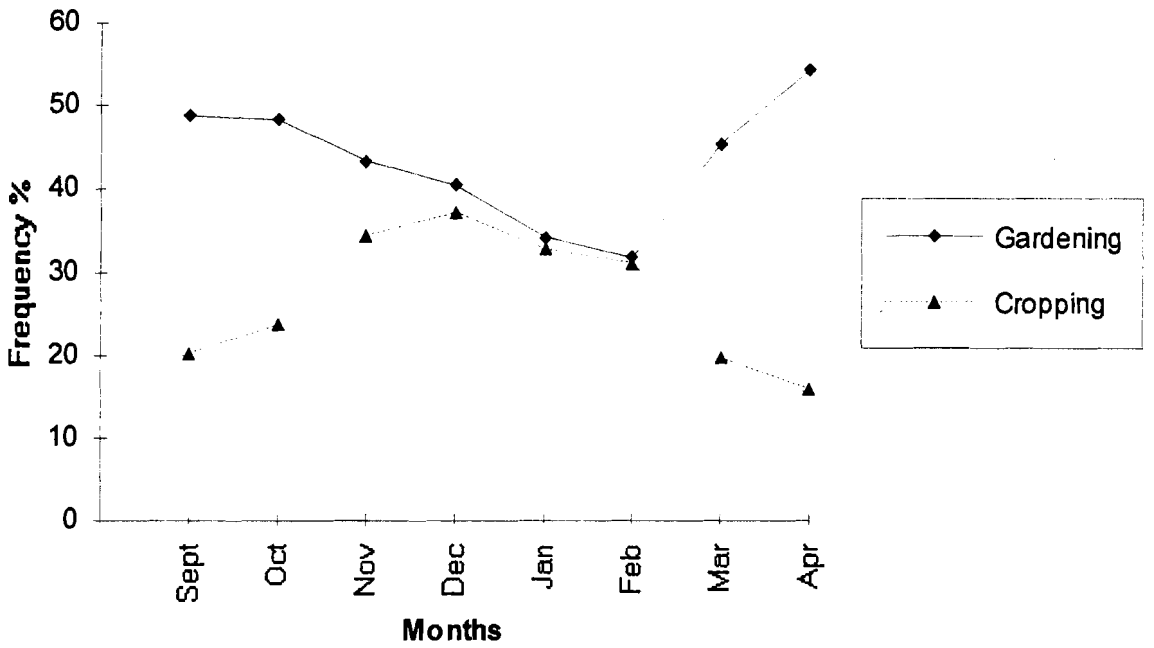
The monitoring exercise had to be done once every month for a period of eight months. This was done in order to achieve a high degree of accuracy in the recollection of household activities within each month. With a longer period respondents are likely to forget some of the events that may have occurred. A shorter recall period therefore ensures a higher degree of accuracy in computing, for instance, the real household costs and benefits of urban agriculture. Furthermore, activities and inputs used over the month can easily be identified.

CHAPTER TWO: URBAN FARMING AND HOUSEHOLD MANAGEMENT PATTERNS

2.1 Agricultural activities

Gardening and cropping activities are usually affected by changes in the agricultural season. Although gardening is carried out throughout the whole year cropping is mainly confined to the rain season. Figure 1. below shows the proportion of respondents carrying out gardening and cropping activities during the monitoring period.

Figure 1. Monthly Proportion of gardening and cropping participants



The coming of the cropping season often has a direct impact on gardening activities in terms of competition on the land resource for crop and vegetable production. Usually part of the land used for vegetable production is set aside for crops in the cropping season. However, this does not necessarily mean that there will be a scarcity of vegetables for the household. Instead, the cropping season also leads to diversification of vegetables that are available to the household. For instance, instead of continual reliance on rape, the household will plant pumpkins. These are often produced in the same piece of land as the maize crop.

Besides competition for land, farming households often experience shortage of manpower to enable

equal participation in all necessary farming activities. Urban vegetable and crop production are activities mainly carried out by women. This could partly be attributed to the fact that most mothers, particularly those of the low income households, are not formally employed. Children when not at school often assist their mothers in land preparation, planting, weeding and watering.

2.1.1 Gardening

This is the most common agricultural activity carried out by the urban residents throughout the whole year. According to the preliminary household study about 65% of urban households practise gardening. Unlike other agricultural activities such as cropping which are affected by seasonal changes, gardening can be practised across all seasons as it is largely dependent on tap water for irrigation. Besides the availability of gardening land, accessibility and affordability of irrigation water are important considerations for a household's participation in urban gardening.

Figure 2 shows the variation in frequency of activities carried out by the gardening households during the monitoring period. Land preparation reaches its peak in the month of September. About 60.4% of the gardening households participated in this activity. Planting of seedlings is also done concurrently with the activity of land preparation by some urban gardeners. The increase in land preparation is also largely due to households changing the old vegetables for new ones. The gardening land is also made ready for the impending cropping season. After this month land preparation declines conspicuously until the end of January as most of the land is covered by either vegetables or crops.

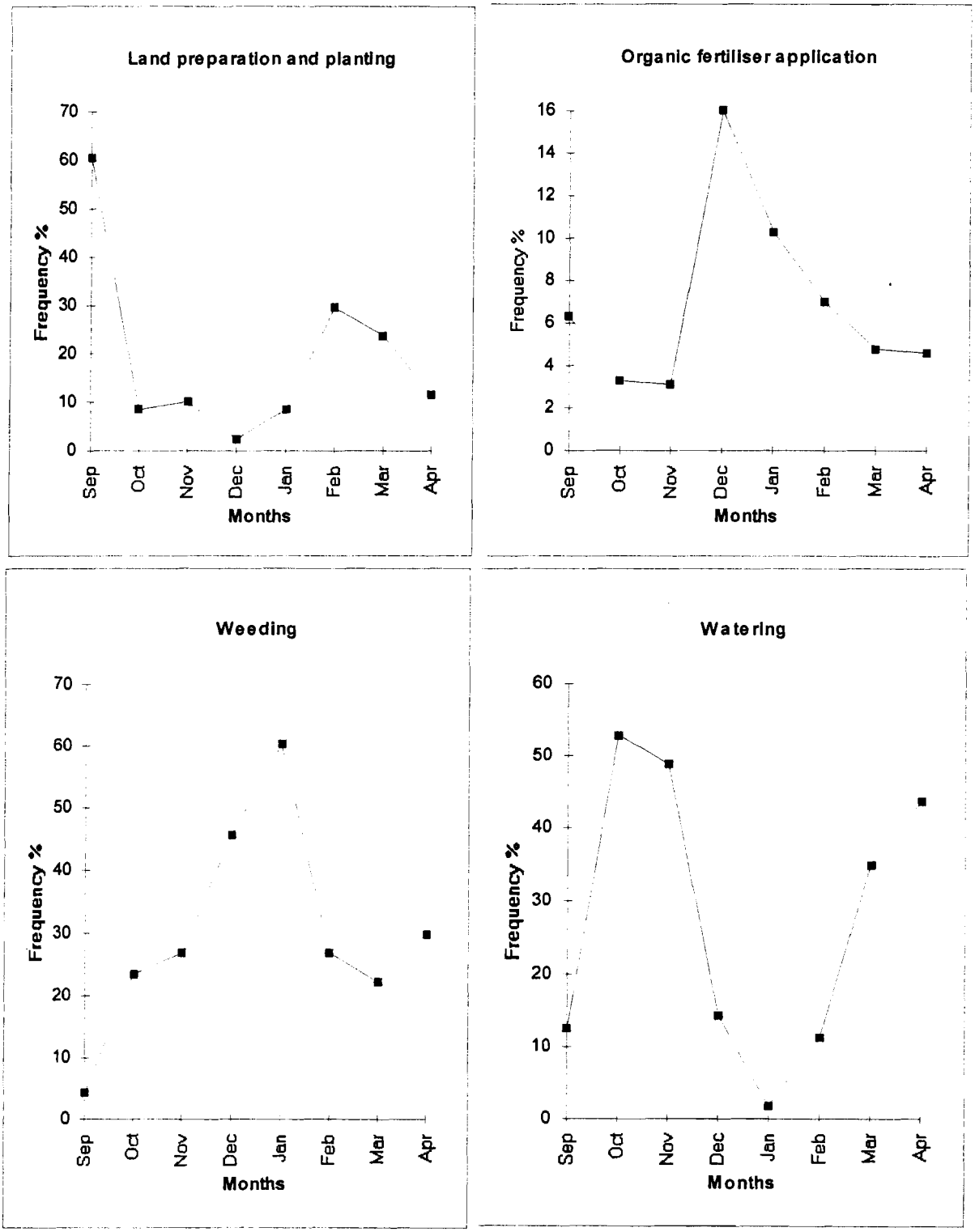
In February land preparation begins to rise and constitute about 29.6% of the activities carried in the garden. The number of households involved in land preparation increased during the month as most farmers who had planted maize in the garden by the end of October were in the process of harvesting. Maize on gardening plots is usually harvested whilst green.

After harvesting most households revert to vegetable production (a form of rotation). About 76% of the changes experienced in the garden relate to an increase in the size of land allocated to vegetable production.

Organic and chemical fertilisers are applied at initial planting and as top dressing. In December and January there is an increased utilisation of chemical and organic fertilisers which may have been necessitated by the loss of fertility due to leaching of plant nutrients.

Weeding is mainly practised in November, December, January and February. This is a time when there are incessant rains which also encourage the growth of weeds. During the same period, there is also an increase in the problem of pests, mostly aphids. Consequently, the use of pesticides by the gardeners intensifies.

Figure 2. Proportion of respondents engaged in particular gardening activities per month



The cost of water is a major constraint in urban gardening. During the dry periods of the year (September, October, November, March and April) , gardening is heavily dependent on tap irrigation. During the month of September and October a considerable number of households experienced reductions in the sizes of gardening plots. Some were simply responding to rising costs of irrigation water associated high levels of water usage and others had no option after the extension of the housing superstructure. The use of gardening space for crop cultivation also resulted in the marginal reduction of land reserved for vegetable production

2.1.2 Cropping

Urban cropping is largely confined to the rain season. Maize cultivation comprises the single most important crop in terms of its spatial coverage and contribution to household food requirements. Other crops grown are sweet potatoes and sweet reeds although at very small proportions (Enda, 1996b). Beans, cowpeas, sweet reeds and pumpkins are often intercropped with maize. As in vegetable production, women comprise the dominant participants in all cropping activities. However, during the school holidays, such as in December, most children assist their mothers in weeding.

Appendix B shows the maize cropping calender for most urban households during the 1996/97 season. Few households had started land preparation activities by the end of September. In Highfields and Braeside, for instance, off-plot land preparation was started early enough by some households. The early start was a strategy to avoid rushing for land when the season is due. In some circles of the society once one prepares the land, s/he, indirectly, has assumed ownership of that piece of land, and it will be difficult to dispossess one of the improved land. One farmer, for example, had her land which she tilled the previous season cultivated by an unknown outsider. She could not seek redress through the law as her utilisation of that piece of land is also considered illegal. In some parts of Highfields maize cultivation was taking place under irrigation close to streams.

However, land preparation is easier when the ground is wet. The activity is mainly spread over two months; October and November. Land preparation was largely carried out using hoes (53.6%) and tractors (42.9%). The use of tractors suggest that some households had larger pieces of land, whilst several households pooling resources together would benefit from reduced costs of tillage. Farmers grouped themselves to facilitate economic utilisation of hired tractors when ploughing the land.

With the advent of the first rains in November, the number of people engaged in cropping activities rose significantly. More people were engaged in the sowing of seeds (44.2%) than land preparation (41.1%). For most households land preparation is done simultaneously with the planting of seeds. Chemical fertilisers are often used at this stage. Organic fertilisers are seldom used in the fields mainly due to their bulky nature. However, some very poor households never any fertilisers.

In December and January most households are engaged in weeding (35.8%). This is followed by the application of chemical fertilisers(19.6%). Fertiliser application was carried out at two levels, initially compound D was applied mostly at the sowing of seeds and Ammonium Nitrate was used later by those whose plants were almost knee high.

With prospects of a better cropping season most households extend their cropping activities. More than

58% of the changes pertain to expansion of cropping fields. It should be noted that in places closer to streams, such extension often amounts to stream bank cultivation. Informal interviews with women in Glen View showed that the offenders are usually the late comers. Although farmers who may have started cultivation earlier would have abided by the 30m restriction from streams, late farmers often invade that reserved land. However, on many occasions due to scarcity of good land and the dire need to meet household needs such expansion is mainly done to increase output. Besides meeting home consumption requirements, the farmers also need surplus output for sale to supplement household income.

The need to expand cropping land is reflected in the nature of the problems identified by the respondents. About 28% of those who faced problems noted shortage of adequate cropping land as the main problem faced. The construction of houses in Dzivarasekwa, for instance, amounted to loss of farming land for some households. Lack of money (20%) and lack of manpower (16%) were some of the problems identified. This demonstrates that urban cropping can be both a capital and labour intensive activity.

It is also noted that about 12% of the problems faced, especially in November/December, relate to animals/rodents. In Dzivarasekwa mice were found to be a problem as these destroyed the seeds before and after germination. Crop theft is usually experienced when the crops are mature for harvest usually in January and February.

The increasing amount of rainfall in January was accompanied by the rapid growth of weeds which threatened the survival of the crops. Heavy downpours led to high levels of leaching and many farmers (26.2%) responded by adding more chemical fertilisers (mainly Ammonium Nitrate).

During the month of January, about 58.3% of the respondents facing problems pointed out poor soil fertility as the main problem in their cropping activities. This could also be attributed to high rates of leaching. Too much water was a problem identified by 16.7% of the respondents. Some viewed all these problems which resulted in poor stunted growth of plants as lack of monetary resources to feed the plants using necessary chemical nutrients.

In February, the main activity on-plot was harvesting of the green maize cobs. However, for some households who started their planting earlier, green maize harvesting started as early as January.
In the off-plot fields very few activities were carried out. The continuous rains from the end of January to mid February hampered most of the activities in the fields particularly chemical fertilizer application and weeding. This also led to extensive loss of soil due to run-off. As a conservation measure, some farmers constructed ridges and drainage canals around their fields to control erosion in their fields.

Although weeding constituted 52.6% of the activities conducted in February many farmers were not able to weed their crops due to frequent rains and as a result most of fields had lots of weeds. Most fields in clay soils suffered heavy waterlogging. Some farmers soon after applying ammonium nitrate, experienced downpours which washed away all their fertilisers. The most affected crops were maize, groundnuts and beans. As the rains continued to fall, some farmers prematurely abandoned their fields.

Land preparation and planting activities in February were mainly for the sweet potatoes. Farmers who had no hope of harvesting anything from their maize crop began to substitute the crop with sweet potato

mounds.

In the months of March and April not more than 19.8% of the respondents were engaged in active cropping activities. The main activity in the fields was harvesting. Most of the crops such as maize, cucumbers, sweet reeds, groundnuts, pumpkins and roundnuts were ripe. In the same months the problem of crop theft was rampant, particularly in Braeside and Highfields. This is the case with most fields that are located further away from the residential areas. In Braeside, fields along the Mukuvisi river experienced a critical problem of thieves who usually steal the crops during the night. In one particular case, a farmer had her entire crop harvested at night by thieves.

Due to the increasing problem of thieves in some suburbs, about 50% of the maize crop was harvested whilst still green. However, others undertook the early harvest in order to avert the rising costs of mealie-meal. Most of the farmers who experienced crop theft pointed out that the vendors who sell green maize around the suburbs were the main suspects. As an adaptive measure, one farmer diversified from open space maize cultivation to cotton farming.

Besides manually transporting the harvest to the homesteads, some households used vehicles and wheelbarrows. Some used hired labour in the process. The harvest was stored in bags mainly in the kitchens, on rooftops and in temporary shacks.

After the removal of the maize crop, some cultivators also started growing beans. One respondent pointed out that this form of crop rotation would enrich his soil. On the other hand, this would guarantee his continual ownership of the land in the next cropping season.

CHAPTER THREE: URBAN FARMING AND HOUSEHOLD NUTRITION

3.1 Introduction

Access to an adequate supply of food is the most basic human need and right. Yet this is an underrated or neglected aspect of city life. Urban food security is dependent on four main factors; availability, accessibility, affordability and stability of such food supplies. Due to the removal of subsidies on foodstuffs, most poor urban households could not afford to purchase food on the open market. A viable alternative is for households to grow their own food requirements which would ensure a stable supply of food throughout the year.

According to the Brundtland Commission Report (1987) " Officially sanctioned and promoted urban agriculture could become an important component of urban development and make more food available to the urban poor." Despite the importance of cities feeding themselves, local authorities have often thwarted food production activities by the urban households. The main reason for lack of support by local authorities may be lack of adequate data on the contribution of urban agriculture to household food security.

In the urban agriculture household monitoring exercise, an attempt was made to measure the impact of urban farming on household food security. Both urban farmers and non-farmers were interviewed. The main hypothesis was that urban farmers are nutritionally better-off than the non-farmers. In order to assess this, questions pertaining to the average number of meals per month and the normal composition of the meals were asked. Apart from current farming benefits, household reliance on some of last seasons produce, was also taken into consideration.

The food security of the households was assumed to reflect on the growth and health of children under the age of five years. The age, height and weight of the children were used to assess the impact of U/A on the growth of children. The issue of total household income was also taken into consideration when computing the measurements. Households with high income levels per month ($3000 and above) have high purchasing power and are most likely to meet all their food requirements in spite of participation in U/A. Therefore, focus in this section was mainly on lower income households who are more vulnerable to market increases in food prices. Genetic variation was not accounted for.

3.2 Food consumption by total household income

The Table below shows a comparison of the number of meals per day by urban agriculturalists and non-agriculturalists.

Table 3.1 Number of meals per day by total household income

Number of Meals	Agriculturalists %		Non-agriculturalists %	
	Below Z $840	$840-$3000	Below Z $840	$840-$3000
1	2.9	0	0	0
2	61	58.1	46.5	45.5
3	33.3	41.6	53.5	52.7
4	2.9	0.3	0	2.2
Total	100	100	100	100

The majority of the farmers earning below $840 and $3000 per month (61% and 58.1% respectively) rely on two meals per day. The non farmers in the same income categories tend to have more meals (3 meals) than the urban farmers. This may be so due to the fact that most farmers with fields away from their homes may not have the chance to return to their homes for the afternoon meal once they leave their homesteads in the morning. Thus, the farmers will just have a morning meal and an evening one. Despite the demand of labour in the fields on the part of the farmers, two meals a day may be viewed as a coping strategy to deal with food insecurity.

According to a study conducted in Dzivarasekwa (Matshalaga, 1997) most urban households delay the morning breakfast and have it towards the afternoon. In doing so breakfast and lunch would have been combined although this does not mean that more food will be available to cater for the two meal times. However, the monitoring survey did not attempt to measure the average daily quantity of all foodstuffs consumed by a household. The main foodstuffs taken at each meal time (breakfast, lunch and supper) regardless of the actual quantity consumed have been measured.

3.2.1 Main foodstuffs consumed

At breakfast time, most households consume bread, tea and porridge. For the poor households the tea is often without milk and the bread without margarine or butter. It is also common for such households to have no tea at all in the morning due to the unavailability of sugar. Some households who cannot afford any of these basic breakfast ingredients may take sadza (a staple maize meal) and some vegetables. These households often end up having two meals a day. In some cases the sadza is often left-over from the previous day's supper. For the non-farming poor households (below $840 per month) there are very few substitutes to bread and tea for breakfast. As these are not producers of any of their daily food requirements, breakfast is often confined to food purchases from retailers and other producers.

For households whose incomes fall between $840 and $3000 per month, more food varieties are added to the breakfast basket. The farming households oftendrop sadza from their morning meal and add rice, milk and eggs for breakfast. Non farming households add sadza to the list. In the afternoon, lunch is often neglected by most households. Only households that do not take heavy breakfast prepare lunch

comprising sadza and vegetables. Some households combine breakfast and lunch by pushing the time for breakfast to the afternoon and as a result tea and bread also constitute part of the meal taken at lunch time.

At supper, sadza, vegetables and meat are the main foodstuffs. As meat is quite expensive, few low income households are able to constantly have this in their meals. Although it is expected that when urban farmers begin to consume produce from their own fields, the resultant income savings could be used to purchase other foodstuffs rich in proteins such as meat and fish, this does not seem to be the case. Figure 3a and 3b show the proportion of respondents consuming foodstuffs rich in proteins on a monthly basis during the monitoring period.

Figure 3a. Consumption of protein rich foodstuffs by month (Income: Below Z$840)

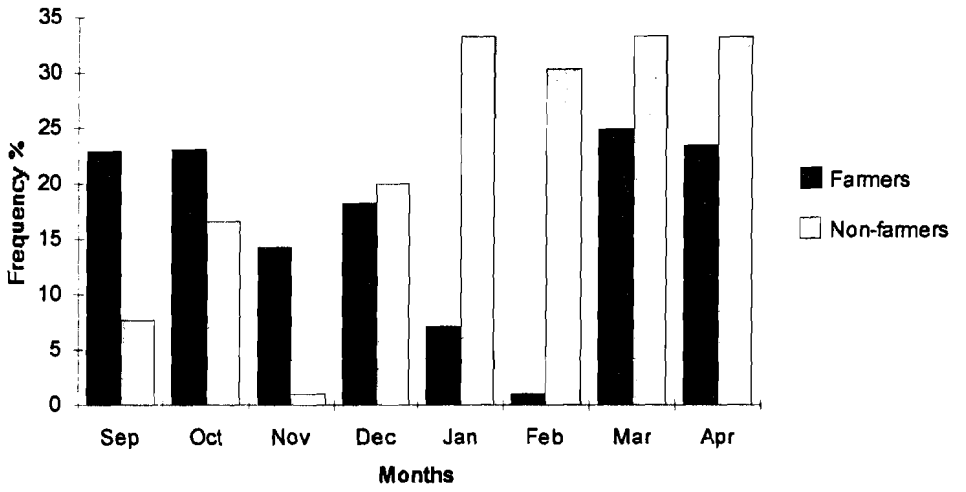


Figure 3b. Consumption of protein rich foodstuffs by month (Income: Z$840-Z$3 000)

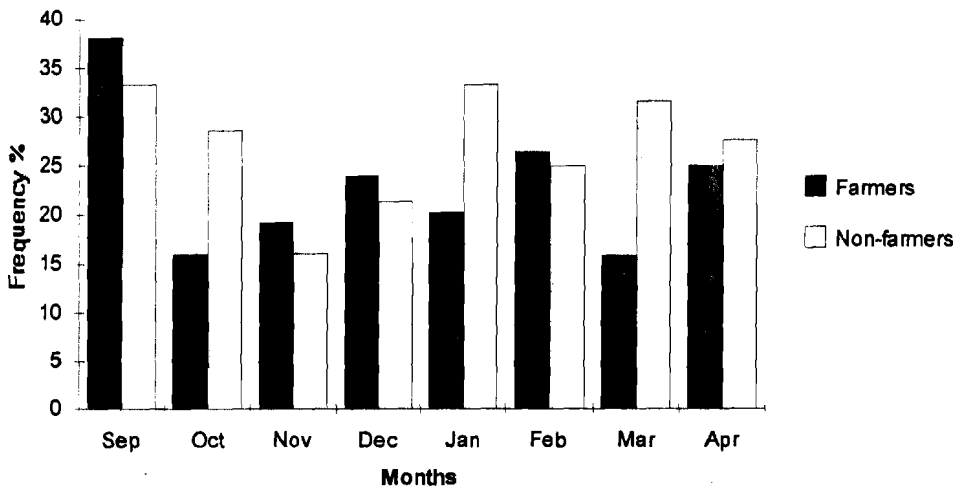


Figure 3a shows that between December and April the proportion of low income urban farmers consuming protein foodstuffs is significantly lower than that of the non-farmers. With plenty of foodstuffs coming from the fields the propensity of farmers purchasing protein rich foodstuffs is significantly reduced. For the period from September to November there are more urban farmers consuming protein rich foodstuffs than the nonfarmers. Although no reasons were obtained for such a trend, this could be due to savings accrued as a result of households consuming their own food. In December there is a shift in the consumption pattern of the farming households. The increased consumption of protein rich foodstuffs by the non farmers is not directly related to farming practices but may be due to a rise in household income. However, the contribution of rural farming by some urban households was not examined. This could greatly affect total household income levels and consumption patterns.

Despite the fact that there will be plenty of food coming from the fields for the urban farmers, the decline of the proportion of low income households consuming foodstuffs rich in proteins, may be a reflection of lack of knowledge on the importance of a nutritionally balanced diet. For the poor households quantity of food and its palatability may be more important than its nutritional composition. Thus savings accrued by household's consumption of self produced food are often diverted to cater for other household necessities such as clothing.

Figure 3b shows that as income increases, expenditure on food purchases between the farmers and non-farmers more or less becomes uniform with minor differences. This could be an indication of the farmers and non farmers alike having reached the optimum consumption level whereby addition of more foodstuffs would not make an incremental benefit to the consumers. However, this may also mean that the farmers have more income saved which can be used for other domestic purposes.

3.2.2 Growth rate of children by household participation in urban agriculture

The pattern in household food consumption does not vary significantly as pertains to children under the age of five. Children in low income households just feed on almost the same type of foodstuffs available to older members of the household. In other households, besides sticking to regular meal times, children consume left-overs from the previous meals at irregular times. Some children have access to dairy milk.

Figures 4 and 5 describe the average heights and weights of male and female children under the age of five years of both urban agriculturalists and non-agriculturalists. The data presented was derived from children of households within the $840 to $3000 income bracket. There were few children from households with incomes below $840 per month.

The figures reveal that children of urban farmers have a higher growth rate in terms of height and weight as compared to children from non farming households. This actually becomes apparent after the children have passed the age of 1.9 years (breastfeeding period) whereby the children will also be feeding on the food that will be available to all household members. However besides genetic influence, some variations in growth may be due to some past experiences of households which may not necessarily be related to urban agricultural activities. For instance, the occurance of diseases or a rise in total household income level at some stage in the past may significantly affect the overal growth rate of the children. The monitoring exercise did not adequately address any such external influences to the growth rates of the children.

Figure 4a. Average age and height of male children

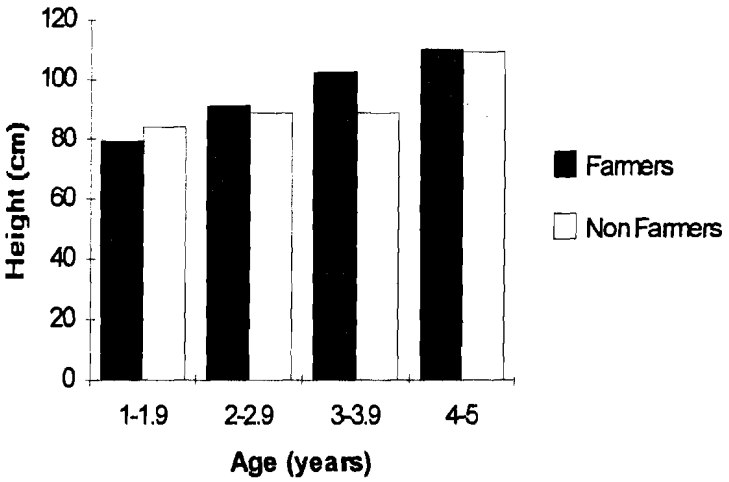


Figure 4b Average age and weight of male children

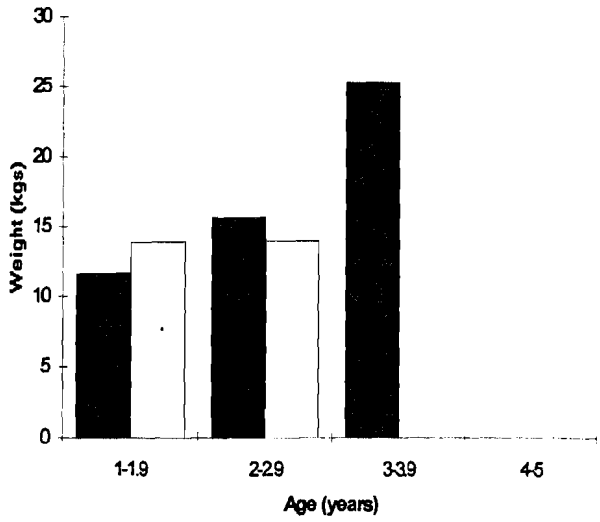


Figure 5a Average age and height of female children

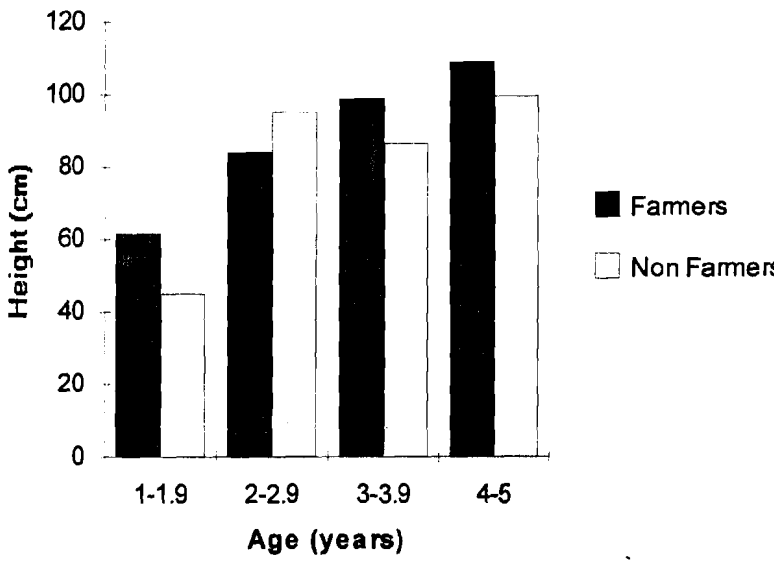
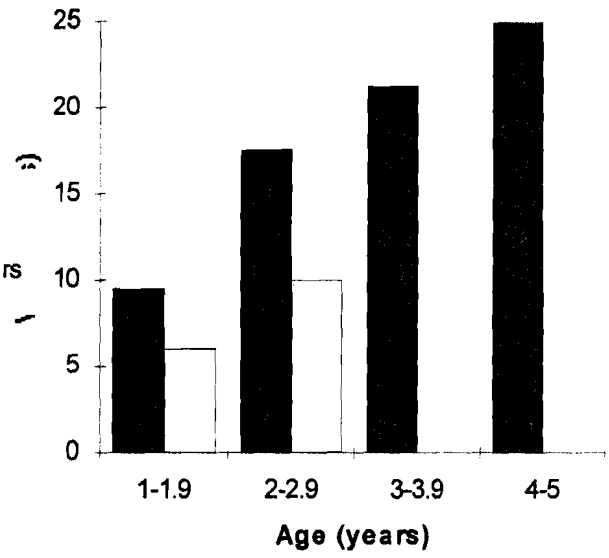


Figure 5b Average age and weight of female children



Nevertheless the collected data suggests that there is a significant relationship between urban agriculture household nutrition and growth rate of children. If this activity could therefore be supported and improved there is great potential for urban poor households to meet one of the basic human need; household food security.

CHAPTER FOUR: URBAN FARMING & HOUSEHOLD ECONOMY

4.1 Introduction

The practice of urban farming (gardening, cropping, livestock keeping and agricultural marketing) is widely viewed by many farming households as contributing significantly to household income savings and generation. The use of own production to meet household consumption requirements leads to income savings generated mainly from formal employment. Such savings are usually used to provide for household requirements other than food. Besides producing for consumption, urban households also produce a surplus that could be sold to the urban market.

With the escalating costs of basic food stuffs such as maize-meal the need for own production has risen tremendously and many urban families process their own raw-food stuffs to cut costs in food expenditure. Such a consumer shift in demand from commercially processed food stuffs to reliance on own production has had its own positive externalities on the urban food market. There has been a rapid increase in hammer mills in Harare over the past five years (Mbiba 1995). This has helped curtail the retail prices of maize-meal. Due to the opening of the food market, more actors have entered this field thereby increasing the competition of food firms. However, it should be noted that not all the maize processed at the hammer mills is produced by the urban farmers. A significant proportion also comes from the rural homes to cover the gap not supplied by the urban producers.

In this section the monetary benefits and costs that accrue to the urban farmer will be computed. A comparison will be drawn between the urban farmers and non-farmers.

4.2 Household expenditure

4.2.1 Income expenditure on basic household needs

The amount of expenditure on basic household items was computed on a monthly basis for the monitoring period. The assumption was that amount spent on some specific items during the year has a direct relationship with events surrounding the household . For instance the availability of 'own' food crops to the household would significantly influence amount spent on food and this in turn would be reflected on the nutritional and health performance of household members. An increase in expenditure on one line item such as school fees has an adverse impact on the amount that is set aside for other household necessities.

Six main household expenditure items were identified. These are expenses on school fees, food, clothing, rent and rates, transport expenses and expenditure on hired labour. Hired labour is not very common to every urban household. In fact, this mainly relates to the more affluent households that can afford paying for such services. This does not mean that the poorer households do not have any use of such services. The survey results showed that amongst the problems faced by the low income households was a critical shortage of labour especially for cropping activities which are labour intensive. This demands the use of hired labour especially at peak periods in the cropping season.

In all income groups, expenditure on food items constitutes more than one quarter of the total household

expenditure. Food expenditure is also the highest expenditure item in all households with the exception of high income households (above 5 000 per month). Income distribution among school fees, food and clothing, may also be viewed as a measure of the well-being of a household. A household that maintains balance in income distribution among these three items can be seen as better -off than one where the bulk of the income is spent on food purchases.

Figures 6a and 6b show average monthly household expenditure levels on food purchases by farming and non farming households.

Figure 6a Average monthly household expenditure on food (Income: Below Z$ 840)

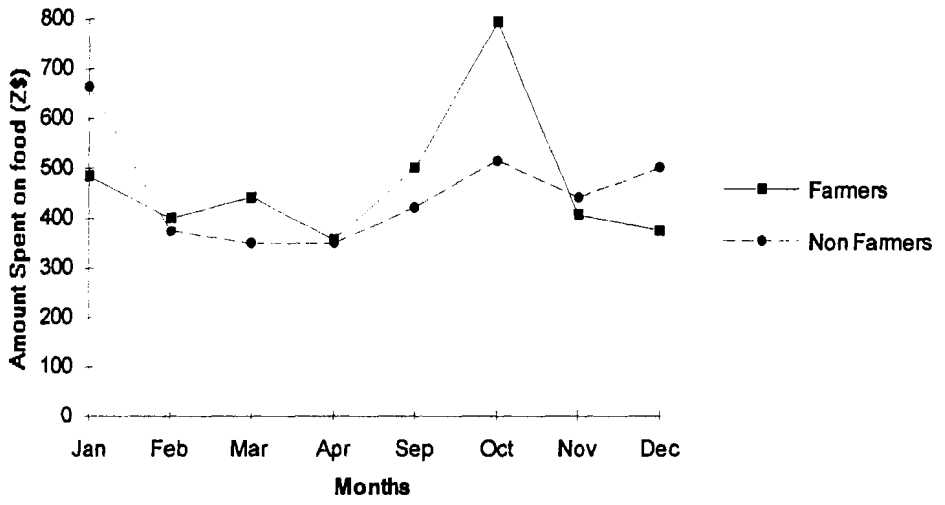
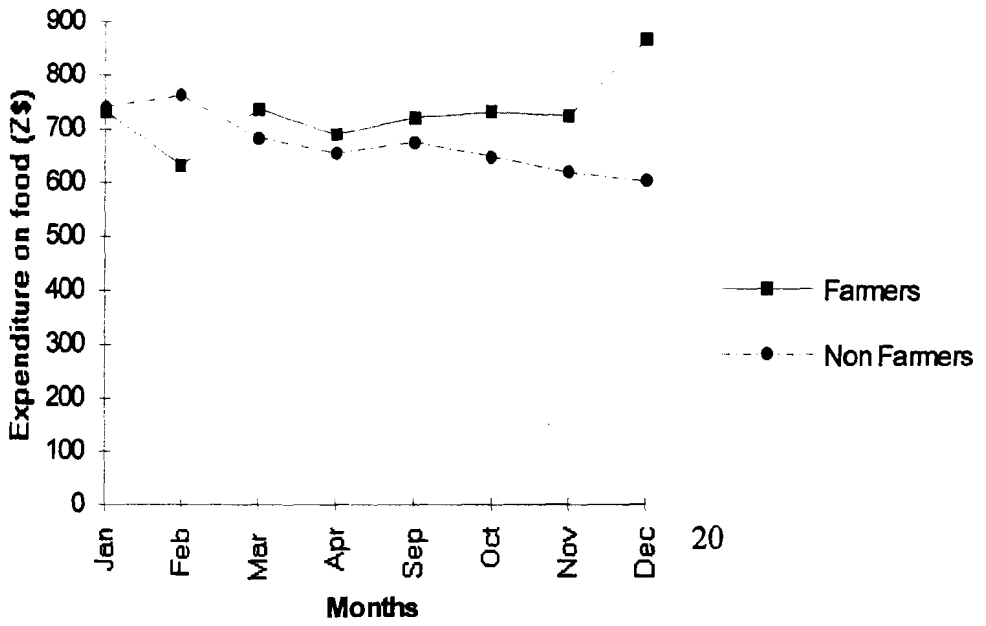


Figure 6b Average monthly household expenditure on food (Income: Z$840 - $3000)



Farming households with total household income below Z$840 per month (Figure 6a) spend more money on food purchases throughout all the months than the non farming households. This may be due to farmers having a high purchasing power derived from the sale of agricultural produce. Such income is spent in the purchase of other foodstuffs such as beef. However, in the season when farmers have more food available from their fields (December, January and February) farmers incur relatively lower expenses on food purchases. The low expenditure on food purchases by non farmers is largely due to the absence of such disposable income and as a result their diets may be deficient in other vital food elements.

The rise in total household income affects slightly the expenditure patterns of both farming and non farming households. Figure 6b shows that farming households within the income bracket Z$840 to Z$3000, have the least expenditure in the month of February. This may be due to high reliance on foodstuffs from the urban home gardens and fields.

As total household income rises above Z$3000 per month, the relationship between urban farming and food expenses is not strong. For some higher income non-farming households expenditure on food is lower than food expenditure by farming households in the same income groups. This scenario can be explained in terms of the law of marginal diminishing returns. For those with high income levels, the optimum food consumption levels have been reached such that an increase in income does not necessarily mean that more of the food-stuffs are purchased. Thus changes on amount allocated to food is most pronounced within the lower income groups.

Generally, in lower income households food takes the greater proportion of household expenditure. As a result children are enrolled at inexpensive schools and expenditure on clothing is incurred only when there is excess income that may be due to crop yield sales. Expenditure on rent, rates (water and electricity), transport are rather fixed. There is very little a household can do to change the existing situation. However, where one resides may be seen as an expression of the amount of money that can be devoted to housing. For the low income households, low or poor housing standards may be the norm.

The monitoring study showed that some low income farming households (below $3 000) usually during peak periods of the cropping season. Relative to their total expenditure, the low income households even commited a larger proportion of their income to hiring labour than the high income households. Although in real terms, the high income households spend more on hired labour than the low income earners, this constitutes a small proportion of their expenditure on other households items. For the poor farming households, expenditure on hired labour is a form of investment in future household food security.

4.2.2 Gardening expenses

Input expenditure

Table 4.1 shows the total and average quantities and cost price of gardening inputs used by some respondents.

Table 4.1 Input expenditure on gardening

Input	Quantity	Mean	N	Cost Price (Z$)	Mean (Z$)	N
Chemical fertilizer	-	-	-	253.5	18.1	14
Organic fertilizer	2673 kg*	40.5	66	98.0	14.0	7
Pesticides	9.056kg	0.181	50	1 143.8	54.47	21
Seeds	-	-	-	55.11	26.43	21
Total				2 050.41	113.0	

*Organic fertilizer quantity was estimated using 20 litre buckets.

Organic fertiliser is mainly derived from individual compost heaps made up of household waste. Therefore, there are few households purchasing such manure from local dealers. On average, a gardening household spends $113 per annum on seeds, chemicals and organic inputs. Input expenditure is very low due to the fact that most gardening participants use organic fertilisers in the form of home-made compost manure. As such limited expenditure is incurred on enriching the soil.

The largest expenditure is incurred on purchasing pesticides. Due to the problem of pests households rely heavily on pesticides from the shops to control the damage on their vegetables. Besides purchasing vegetable seeds from the shops, some households rely on cuttings from such vegetables as covo or rugare, which can be propagated easily using the cuttings.

Labour Expenses

Table 4.2 depicts the monthly average and total average time a gardening household may spend on particular gardening activities.

Table 4.2 Monthly average and total average time spent on gardening activities

Activity	Average Time (hours)	Total Average Time (hours)	Average No. of Participants
Land Preparation	2.14	4.09	1.91
Planting seeds	0.8	1.4	1.75
Applying organic fertilisers	0.82	1.26	1.54
Applying chemical fertilisers	0.53	0.82	1.55
Applying pesticides	0.62	0.91	1.46
Weeding	1.75	2.94	1.68
Watering	6.32	12.32	1.95
Total		23.74	

Table 4.4 shows that land preparation, weeding and watering are the main time consuming activities in the garden. The number of people who work in the garden per given month ranges from one to six. Given a total average of 23.74 hours of work in the garden, an individual household member would be employed for at least three days per month. Given a minimum wage of Z$24 per day, the cost of gardening labour would therefore be approximately Z$864 per year.

It should also be noted that time spent in gardening activities is relative to the size of the gardening plot.

According to a study by ENDA (April, 1996) the average size of gardens in the high density areas is 25.2m^2. Most of the gardening activities are carried out on the residential plot.

Water charges

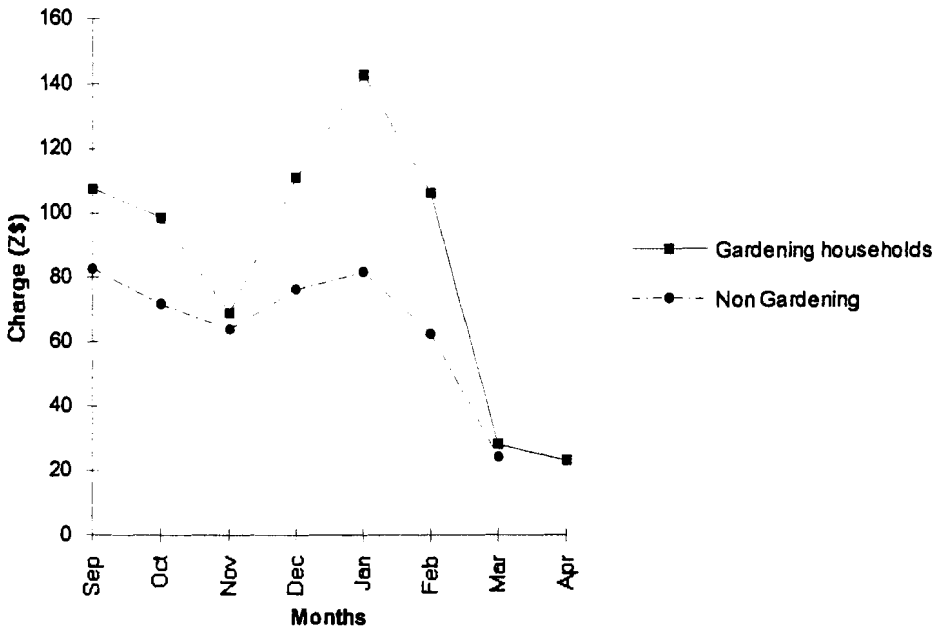
The impact of urban gardening on household economy can further be examined by drawing a comparison between the participants and non-participants. Gardening activities utilise larger quantities of household water. About 12.32 hours of the total time spent in gardening is spent on vegetable watering.

The main source of household water in Harare is tap water. About 97.4% of the respondents indicated that they rely on tap water and only 2.6% have access to borehole water. For the gardening participants, only 3.5% of the households had access to borehole water. However, most of those with boreholes are located within the low density high income areas. No boreholes were found in the high density low income areas.

Although there are a number of streams that flow across the residential suburbs, no gardening households use this water for irrigating their vegetables. Figure 7 shows the monthly average water charges incurred by both gardening and non-gardening households throughout the monitoring period.

Gardening households incur higher water charges than non-gardening households in almost all months through the monitoring period. This shows that gardening is an all year round activity. The use of hose pipes in irrigation of gardens, a demeanour usually denounced by local authorities, amounts to large quantities of water being lost through urban gardening. Some practitioners, in an effort to avert the harsh reality of the law undertake hose pipe irrigation at night where local authority policing activities are less frequent.

Figure 7. Monthly average household water charges



The total monthly average water charges for gardening households is Z$90.04. The highest expenditure on water was recorded in January (142.78) and the lowest in April (22.96). However, high water charges, throughout the year, are not necessarily a reflection of increased rate of vegetable irrigation. Within some suburbs in Harare, water bills received monthly do not pertain to the quantities of water consumed within that particular month. Payment of water charges usually lags behind by about two or more months. Furthermore, besides increases in water rates, water is also used in a variety of household activities, for instance laundry. A change in household size may result in a significant change in water charges incurred per given period.

Cropping expenses

Expenditure on cropping inputs

Table 4.3 shows total and average quantities and cost price of the main input expenditure items on urban cropping activities.

Table 4.3 Input expenditure on urban cropping

Inputs	Quantity (kg)	Mean (kg)	N	Cost Price (Z$)	Mean (Z$)	N
Chemical fertilizer	1 734.5	32.1	54	2 922.4	86	34
Organic fertilizer	177*	18	10	177	35.5	5
Seeds	208.5	4.5	46	971.5	36	27
Total				2 050.41	157.5	

*The quantity of organic fertilizers was measured using 20 litre buckets.

On average a household engaged in urban cropping spends at least $157.5 per annum on cropping inputs. However, some poor households do not even use any fertilisers in cropping activities and therefore would experience low yields at harvest time. Apart from purchasing chemical fertilizers from the shops, some informal exchange of inputs also occur among the urban farmers. This exchange which can be based on economies of affection may result in the underestimation of the actual input costs as these are not monetarised. About 8.3% of the respondents obtained some of their chemical fertilisers from friends, relatives or neighbours. As regards seeds, about 14% obtained these from the same sources. However a smaller proportion (6%), used retained seed.

Organic fertilisers and pesticides are seldom used in open space crop cultivation. As open space fields are relatively larger, acquisition of bulky organic fertilisers for extensive coverage, may be a strenuous activity.

Labour

Urban crop farming is a labour demanding activity, especially for some households with larger pieces of land. The most labour intensive activities are land preparation and weeding as depicted in Table 4.4. Land preparation and weeding are the most demanding activities in the cropping fields. However, most cropping activities are dependent on rain water. Amount of time spent on irrigation usually pertains to on-plot crop cultivation, which is mostly at a small scale.

Table 4.4 Average time spent on cropping activities per month

Activity	Average time (days)	Total Average time (days)	Average number of participants
Land preparation	3.75	11.25	3
Planting seeds	1.92	5.38	2.8
Applying organic fertilizers	2.47	5.19	2.1
Applying chemical fertilizer	1.92	5.57	2.9
Applying fertilizer pesticides	1	3	3
Weeding	3.7	10.36	2.8
Watering	0.43	1.33	3.1
Total		42.08	

Urban cropping is largely practised between November and February. For those who start earlier than November, there is much reliance on irrigation due to scarce rainfall. The application of organic fertilizers is largely confined to on-plot crop production. Organic fertilizers are bulky and are not easily transported to the off-plot fields.

During the peak periods of the cropping seasons, most cropping households make use of hired labour mainly for land preparation and weeding activities. However, only households which are better off could afford engaging external labour when the need arises. For the poorest households, hired labour is not affordable. Consequently, most fields of such households were destroyed by the weeds. The problem was exacerbated by the attack on the maize crop by the 'grey leaf spot' which dried the crop prematurely. Some farmers used pesticides to try and curb the spread and damage of the disease but to no avail.

Using the total average time and the average number of people involved, urban cropping can gainfully employ at most 2 persons per year per household (i.e. 42.08 man-days x 8 months). However, it should be noted that time spent in the fields is directly related to the size of the field. Households with larger plots would definitely spend more time in the field than households with small fields. According to the ENDA study (April, 1996) the average size of off-plot fields in the high density suburbs is 499.3m^2.

4.3 Household income and savings from urban farming

Urban farmers view their activities as economic ventures that generate household income and also leads to substantial savings of incomes generated from formal employment. In this section real monetary benefits from agricultural activities, and the income saved by households consuming their own self-produced food, are computed. Focus is mainly on income or savings derived from gardening, cropping, marketing and livestock keeping activities.

4.3.1 Gardening income and savings

Gardening income is derived from direct sales of home-grown vegetables. The sale could be conducted from the point of production or at street corners and council marketing stalls (ENDA, April, 1996). However, amount generated from on-plot sales was not computed as such sales are usually on smaller proportions and on an ad-hoc basis.

Income savings due to gardening practice were computed on the basis of the number of times a household relied on garden produce. The main vegetable used to compute such savings is rape which is mainly combined with the staple food crop maize for an individual household's main meal per day. An average household of 5 persons can consume $4.50 worthy of vegetables per day. (This would comprise rape, and either onions or tomatoes). On a weekly basis, a gardening household can consume vegetables for 4.45 days on average. If this is extrapolated to a yearly household dependance on garden produce, with all the other factors constant, a household would consume garden produce for about 231 days. The total income savings a household could accrue from reliance on garden produce would therefore be Z$1 039.50 per annum.

4.3.2 Income and savings from crop production

The main crops grown off-plot are maize, sweet potatoes and groundnuts. For the 1996/97 season, due to heavy rains accompanied with the outbreak of diseases and weeds , the maize yield was adversely affected. Thus the forecast yield may be significantly lower than in a good season.

Table 4.5 below shows the average, minimum and maximum yields of some urban cropping households.

Table 4.5 Expected crop harvest

Crop type	Yield (kgs)			
	Minimum	Maximum	Mean	N
Maize	20	2 000	172.35	34
Sweet-potatoes*	20	200	77.14	7
Groundnuts	90	90	90	1

*The estimate yield of sweet-potatoes was computed using 20 litre buckets.

The above maize yield estimates do not take into consideration the total quantity harvested whilst green. This is however reflected on the nutritional well-being of the households especially on periods where such green maize is ready for harvest. The dried maize is often processed at urban hammer mills to make mealie-meal. The milling costs of such hammer mills ranges from $2.50 to $4.00 per 20 litre bucket.

The consumers of the hammer meal processed maize (mugaiwa), argue that a bucket of such maize meal actually lasts longer than a 20kg bag of roller meal. The retail cost price of a 20kg bag of roller meal in Harare is about $62.00. Using this figure, households with an average yield of 172.35 kg would save about Z$508.44 per year on the purchase of roller meal (i.e if the processing costs are computed using a charge of $3 per bucket).

A bucket of maize on the street market costs about $30.00 . Therefore if non farmers would purchase such maize, instead of roller meal, they would make a substantial saving of $29.00 per bucket of maize bought. This also shows that the benefits of urban farming are not only confined to the practitioners but these also trickle down to the non farmers.

On the other hand, sweet potatoes are used as an important substitute for bread. Assuming that a family of five would take at least 10 days to consume a bucket of sweet potatoes, and the same household, without sweet-potatoes would consume $9.00 worth of bread per day (one loaf of bread costs $4.50), then for an average of four buckets of sweet potatoes, the household would save about $360 per annum.

4.3.3 Income generated from vegetable and crop vending (marketing activities)

This section focuses on those households which take their agricultural products to some marketing points around the suburbs. The products may be coming directly from their own plots or they may be sourced from external larger markets such as Mbare Musika (ENDA, April, 1996).

The average income generated from marketing activities ranges from $50 to $2 000 per month. Using the monthly average income of households derived from marketing activities, an individual household would accrue as much as $4 382.65 within a period of eight months (i.e. September to April).

Agricultural vending can be a form of full time employment that contributes significantly to urban economy. However, most of the full time vendors depend to a large extent on products which do not emanate from the activities of the urban agriculturalists. About 24.6% of those involved in marketing, sell leafy vegetables from their residential plots. Most of the other vending products are largely obtained from external sources. This shows that urban agriculture plays an important role in the provision of food to the city consumers.

It is also common that vendors use some of the products acquired for sale to meet household consumption requirements, without directly paying for the products. This also boosts their households' nutritional status. Thus, the stated income derived from marketing activities may actually be an underestimation of the actual value of the activity.

4.3.4 Income and savings from urban livestock rearing.

Chickens and rabbits are the main forms of livestock kept within the urban areas. However, chickens are more common and favoured by most households as they are saleable and provide a special dish to most households. Rabbits, on the other hand, are very few on the market as they are sometimes kept as mere pets and not necessarily for consumption.

Table 4.6 below shows the total number of chickens kept, consumed and sold during the monitoring period.

Table 4.6 Number of chickens kept, consumed and sold

Chickens kept		Consumed		Sold	
Total	Mean	Total	Mean	Total	Mean
2735	51	371	8	488	29

The average selling price of one chicken in Harare is Z$30.00. Thus, on average a household kept

chickens worthy $1 530.00 between the period September 1996 and April 1997. The average value of chickens sold by a household is $870.00. If the cost of stockfeeds and other direct expenses are subtracted the household would therefore have a net benefit of $668.42 (i.e $870- $201.58). The net benefit, although quite significant for the poor households, may actually be an underestimation of the real value of urban livestock keeping as this does not take into account income gained through the sale of eggs.

CHAPTER FIVE: CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

The activity of urban cultivation threatens to reach uncontrollable limits especially as the situation becomes more desperate for the urban poor, both unemployed and underemployed. The activity is predominantly practised by women who comprise the majority of the urban unemployed. The adverse economic and climatic conditions, apart from mere population increase, are largely accountable to the phenomenal increase in urban farming activities. The main driving force has often been seen as the escalating costs of basic foodstuffs. Food security is a basic human need and women being, culturally, the overseers of household food provisions, have ventured into informal coping strategies to sustain their family livelihoods. Urban agriculture in Harare has emerged as the main adaptive strategy by the poor households in Harare. However, city managers and outsiders view the gains from urban farming as just marginal and consequently the activity has been despicably underrated.

From the monitoring exercise, it is evident that there is great potential for maximising household benefits from urban farming. The main direct benefits of urban agriculture on the household point of view can be summed up as;

(a) Supplement household income
(b) Encourages household savings
(c) Ensures household food security
(d) A source of employment

Urban agriculture can also be seen as fostering social ties of the civil society as households share and pool resources together especially cropping inputs and during land preparation activities.

The results of the monitoring exercise also demonstrate that low income urban farmers are economically and nutritionally better off than their counterparts. This is also reflected in the growth performance of the children under the age of five years. Children from non farming households show aspects of stunted growth and loss of weight as compared to children from farming households. Even though the availability of own home grown food for the farming households tends to militate against the purchase of other nutritionally rich foodstuffs from the shops, this does not significantly affect their growth performance to levels beyond that of children from non farming families. This trend is prominent in the period when farmers are relying on foodstuffs from their fields and gardens.

The common argument against urban agriculture relates to environmental degradation as a result of soil erosion and siltation and eutrophication of the rivers. Although there is a high rate of chemical fertiliser application in the fields and pesticides utilisation in the gardens, the impact of such practices as industrial pollution of the city's environments is tremendous. The environmental impact of urban agriculture, conducted during the same period, is documented in a separate environmental report. However, the costs of fertilisers and pesticides are prohibitive especially to the poorest of the urban farmers who cannot afford to incur higher expenditure levels in the activities. Furthermore, those who use chemicals apply them in the fields whereas gardening is largely dependent on organic manure.

The main problems associated with urban agriculture at the household level, can be summed up as;

(a) insecure land tenure
(b) lack of farming knowledge
(c) crop/vegetable pests and diseases
(d) crop theft
(e) lack of inputs; labour, capital and tools
(f) high water charges

Despite such problems the practitioners see urban farming as a lucrative venture. If these could be addressed high productivity levels will be achieved.

5.2 Recommendations

In spite of the current obstacles encountered by farming households, urban agriculture should be an integral component of urban land use systems and an element of social planning for sustainable city development. In the face of recurrent national droughts and uncertain global climatic conditions, the survival of the urban system depends on cities meeting some of their food requirements. Efforts should therefore be directed towards developing mechanisms and policies that enhance sustainable urban agricultural development, rather than seeking ways of eradicating the practice. The following recommendations derived from discussions with urban farmers and experiences elsewhere, would assist in the realisation of such an objective.

1. **Development of enabling policies for urban agriculture**

The practice of urban farming, particularly open space cultivation, in Zimbabwe an towns and cities, is not backed by statutory provisions. This makes the activity illegal and therefore unsupported. The initial step towards recognition of urban cultivation in Harare may be the review of existing policies and formulation of an enabling policy for the practice of urban agriculture. NGOs involved in community work and lobbying activities should spearhead this process which should also bring together planners, researchers, local authorities and central government officials.

2. **Gender sensitivity in the design and planning of urban infrastructural services**

Although women comprise the majority of practitioners engaged in urban agriculture, their needs have so often been neglected in the planning of urban settlements. This phenomenon is not only found in Zimbabwe an cities, but also in other Third World cities. Moser (1995) in an attempt to explain why most urban policy remains 'essentially gender-blind' argues that policy makers are more concerned with development control mechanisms rather than empowerment of the urban women.

Planners and policy makers therefore need to consider and incorporate the needs of all the sectors of the urban population in the layout and design of urban settlements. An important consideration is the concept of agro-residential planning whereby residential locations are designed with space provided for agricultural activities. Participatory approaches often promulgated in the design and implementation of urban local and master plans are not adequate in ensuring public participation as these are mainly

accessible to the more affluent sectors of the society.

However, more gender focused research still need to be done whereby issues of resource allocation and distribution will be explored.

3. **Provision of extension services**

With the growing practice of urban farming, the availability of extension services becomes crucial. In Zimbabwe, agricultural extension has often been viewed as a service for the communal farmers. The necessity of such services in urban areas is little understood by policy makers.

The household study revealed that urban farmers are in need of extension advice to improve their productivity. Specific areas which need extension advice include;

(a) environmentally sound vegetable and crop production techniques

(b) improvements in crop and vegetable species diversity and composition with a view to cater for household and local demand.

(c) alternative methods of improving soil fertility and eradication of vegetable/crop pests and diseases. This would involve natural and traditional ways of pest control and improved technology in compost production.

(d) education on family nutritional requirements for healthy urban households.

For efficient delivery of extension services farming groups should be formed. NGOs and extension officers should also help in the design of alternative farming models for the existing open land parcels in the urban areas. These models can later be replicated in other parts of the city.

4. **Improve access to farming inputs**

Mechanisms should be developed which would ensure that improved urban agriculture would benefit the most disadvantaged sectors of the urban population. The initial step therefore is the identification of needy households to have first priority in resource allocation. NGOs and local authorities would assist in the identification and provision of farming land. A leasing mechanism can be devised.

5. **Urban waste utilisation and recycling**

Urban agriculture can make significant use of waste material found in the city. This would also result in the creation of cleaner urban environments. Household waste may be used for compost production and consequently this would reduce the utilisation of chemical fertilisers. Systems to recycle sewage water should also be developed. On the other hand, technology for collecting rainwater that can be used for gardening purposes could be developed. This would result in low costs incurred in the use of tap water.

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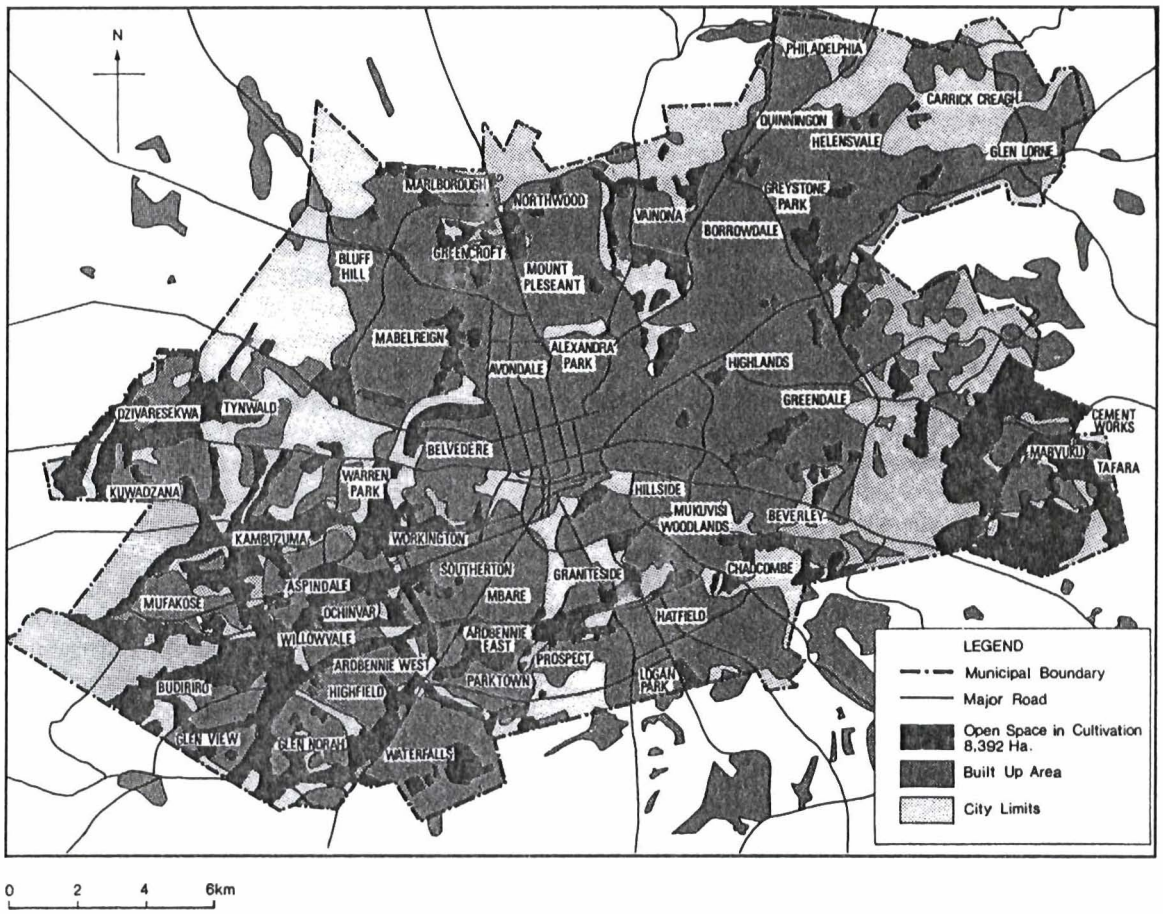
APPENDIX A

OPEN SPACE CULTIVATION IN HARARE (1994)



Source ENDA-Zimbabwe, 1994.

APPENDIX B

HARARE CROPPING CALENDER : 1996/97 SEASON

ACTIVITIES	MONTH							
	September	October	November	December	January	February	March	April
Land Preparation								
Planting								
Apply Organic Fertilisers								
Apply Chemical Fertilisers								
Apply Pesticides								
Weeding								
Watering								
Harvesting								